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The Role of Hemocytes cells in Cell- mediated Immunity of Insects

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The innate immunity is the sole response of invertebrates for the protection against foreign substances and pathogens. The innate immune system of insects is divided into humoral and cellular defense responses. Humoral defenses include antimicrobial peptides, the cascades that regulates coagulation and melanization of haemolymph and the production of soluble effector molecules. The cellular immune response of insects refers to defense responses mediated by hemocytes such as phagocytosis, encapsulation and clotting. Plasmatocytes and granular cells are the hemocytes types involved in these responses. Besides hemocytes a number of humoral effector molecules required for killing different foreign invaders. Insects produce several terminally differentiated types of hemocytes that are distinguished by morphology, molecular and antigenic markers and function. Infectious microorganisms are recognized by binding of hemolymph plasma proteins to microbial surface components. This pattern recognition‖ triggers phagocytosis and nodule formation, activation of prophenoloxidase and melanization and the synthesis of antimicrobial proteins that are secreted into the hemolymph. The microbes in nodules and parasites in capsules are almost certainly killed by a combination of being entombed in a hard capsule and thus isolated from the nutrients in the hemolymph, as well as the effects of the cytotoxins, including the products of the prophenoloxidase cascade. The nodules and capsules remain inside the insect‘s hemocoel until it die.

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